KARAKTERISTIK ISOTERM SORPSI AIR PADA TEPUNG UBI JALAR TERFERMENTASI DENGAN ANGKAK

(WATER SORPTION ISOTHERM CHARACTERISTICS OF FERMENTED SWEET POTATO FLOUR WITH RED YEAST RICE)

Yulinda Eka Ayu Rukmawati[1], Sri Hartini[2], Margareta Novian Cahyanti[2]
[1] Mahasiswa Program Studi Kimia Fakultas Sains dan Matematika
[2] Dosen Program Studi Kimia Fakultas Sains dan Matematika
Universitas Kristen Satya Wacana
Jl. Diponegoro 52-60 Salatiga 50711 Jawa Tengah - Indonesia
652013026@student.uksw.edu

ABSTRAK

Penelitian ini bertujuan untuk menentukan kurva isoterm sorpsi air, model matematika dan karakteristik isoterm sorpsi air pada tepung ubi jalar terfermentasi dengan angkak. Model matematika yang digunakan GAB (Guggenheim Anderson deBoer), BET (Brunauer Emmet Teller) dan Caurie diuji ketepatan model dengan MRD *(Mean Relative Determination)*. Hasil penelitian menunjukkan bahwa kurva isoterm sorpsi air pada tepung ubi jalar fermentasi dengan angkak memiliki bentuk sigmoid (tipe II). Model matematika yang tepat pada tepung terigu ubi jalar terfermentasi dengan angkak adalah model GAB dengan MRD pada suhu 30 ° C, 35˚C dan 40˚C adalah 4,41%, 2,50% dan 3,37%. Karakteristik isoterm sorpsi air pada tepung ubi jalar terfermentasi dengan angkak termasuk air terikat primer pada suhu 30 ° C, 35˚C dan 40˚C pada model GAB adalah 6,79%, 6,50% dan 9,85%, model BET adalah 5,15% , 4,88% dan 6,29%, sedangkan model Caurie sebesar 1,38%, 1,33%, 1,36%, air terikat sekunder adalah 63,05% dan air terikat tersier 95,09%, luas permukaan pada suhu 30˚C, 35˚C dan 40˚C adalah 56,05 m^2/g; 57,68 m^2/g dan 50,82 m^2/g, entalpi dan entropi proses penyerapan air menurun saat kadar air meningkat.

Kata Kunci: Model Matematika; Angkak; Termodinamika;Tepung Ubi Jalar; Isoterm Sorpsi Air

ABSTRACT

This research aims to determine moisture sorption isotherm curves, mathematical models and moisture sorption isotherm characteristics of fermented sweet potato flour with red yeast rice. Mathematical models was used GAB (Guggenheim Anderson deBoer), BET (Brunauer Emmet Teller) and Caurie were tested the accuracy model with MRD (Mean Relative Determination). Result of the study showed that the moisture sorption isotherm curve of fermented sweet potato flour with red yeast rice had the sigmoid form (type II). The best mathematical model of fermented sweet potato flour with red yeast rice was GAB model with MRD at temperature 30˚C, 35˚C and

40˚C were 4.41%, 2.50% and 3.37%. Moisture sorption isotherm characteristic of fermented sweet potato flour with flour by red yeast rice included primary bound water at temperature 30˚C, 35˚C and 40˚C in GAB model were 6.79%, 6.50% and 9.85%, BET model were 5.15%, 4.88% and 6.29%, while Caurie model were1.38%, 1.33%, 1.36%, secondary bound water was 63.05% and tertiary bound water was 95.09%, surface area at temperature 30˚C, 35˚C and 40˚C were 56.05 m^2/g; 57.68 m^2/g dan 50.82 m^2/g, enthalpy and entropy of water sorption process were decreased when moisture content increased.

Keywords : Mathematical Model, Red Yeast Rice, Thermodynamic,Sweet Potato Flour, Water Sorption Isotherm.